

The image shows an iPad with a blue screen displaying the title of an article. The iPad is positioned in the center of the frame, set against a background of blurred bookshelves in a library. The screen displays the following information:

- Top status bar: Wi-Fi signal, time (12:34), battery level (100%).
- Title area (blue background):

**School Librarians
and Open
Educational
Resources Aid
and Implement
Common Core
Instructional
Content in the
Classroom**

- Author area (blue background):

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- Bottom navigation area (orange background):

Three circular icons: a square with a double arrow, a house, and a circle with a double arrow.

By 2013 a majority of states adopted the Common Core State Standards (CCSS) in English Language Arts and Mathematics in a response that addressed the declining educational achievements of students in the United States. A major challenge to Common Core implementation is the shortage of new and authentic standard-aligned material (William and Flora Hewlett Foundation 2015). As districts face the necessity of purchasing new instructional materials aligned with the CCSS, open educational resources (OERs) have become crucial. The OER has become a central model for the development and dissemination of free online content. Digital libraries of OERs have increased significantly, providing schools and teachers with standards-based materials for developing CCSS-aligned curriculum (Waters 2013).

Open Educational Resources Defined

The theory of OERs was initially defined at the 2002 UNESCO Forum on the Impact of Open Courseware for Higher Education in Developing Countries (Armellini and Nie 2013). The OER concept is defined as technology-enabled open provision of educational resources for consultation, use, and

adaptation by a community of users for noncommercial purposes. These educational resources reside in the public domain on the Internet and include textbooks, videos, podcasts, and any other learning-related materials such as teachers' guides, lesson plan recreations, experiments, demonstrations, and curricula (Butcher 2015). Teachers and students have access to these resources without the obligation to pay royalties or license fees, and, as a result, education transformation reaches the classroom with a lower cost than if commercially produced materials are used.

Creative Commons licenses permit the sharing of resources through free legal tools, and serve an active role in the open-access movement. Creative Commons licenses are not substitutes for copyrights. The licenses work alongside the copyright and allow producers to change the copyright terms to best fit users' needs (Sharma 2013).

Adapting and Implementing the CCSS

The CCSS are relatively new in education. In 2009 state leaders encouraged creation of the CCSS as real-world learning goals for the purpose of developing college- and career-ready students. By

2011 states began considering the standards. By 2013 forty-five states had implemented the CCSS. These new standards meant directing students away from routine memorization toward higher-order critical thinking (Burks et al. 2015).

Although the CCSS were controversial among both teachers and parents, when the standards were adopted teachers were still expected to recreate their own curriculum, lesson plans, and benchmark assessments—in many cases, from scratch. A survey conducted in 2016 by the Center for Education Policy Research at Harvard University reported that 80 percent of ELA teachers and 72 percent of mathematics teachers use curricular materials that they or their coworkers at their school created (Kane et al. 2016). Teachers also reported seeking a vast array of online sources for their materials. Not only did 45 percent of school districts report significant problems locating standard-aligned textbooks and material, but the standards required lessons that were different from what most teachers were accustomed to teaching. Furthermore, fewer than 50 percent of the school districts that adopted the CCSS offered professional development workshops that demonstrated aligning the CCSS with classroom instruction and student assessment (C. Thompson 2015).

OER Implementation

Adoption of the CCSS can be regarded as the perfect storm (Johnson 2014). It brought a change to schools by making it necessary to depend on technology in classrooms, redesign curricula, and, more importantly, access OERs in an effort to align lessons with standards. Rather than relying on textbooks, teachers are obliged to assess and access OERs. The continuation of the development and enhancement of classroom curricula by teachers is now regarded as a process (Cavanagh 2013).

According to Liana Heitin (2015), fewer than 33 percent of educators have access to premium CCSS-aligned textbooks. In general, standards-aligned commercial content is not being widely produced. For a variety of reasons, some states are abandoning the CCSS. The fear that more states might abandon the CCSS has caused publishers to not fully invest in developing CCSS-aligned textbooks (William and Flora Hewlett Foundation 2015). Moreover, the Council of Great City Schools conducted a survey and reported that a majority of teachers are using instructional materials they developed on their own. Use of OERs could facilitate a collaborative effort in the development of CCSS-compliant curricula among school districts. The content that OERs provide is well-suited to target the lack of commercially produced standards-aligned materials (C. Thompson 2015).

OER Extent and Availability

As more school districts are using free online resources to enhance classroom lessons and textbooks, the extent and availability of OERs are continuously developing (Terrell 2016). Digital libraries are adding to the collection of

OERs every week. Teachers can locate materials through specialized OER search engines such as OER Commons. (See the sidebar for the URL of this and other OER-related resources.) OER Commons provides a voluminous collection of resources aligned to the CCSS; the collection includes lesson plans, primary sources, and assessments (Ash 2012). Teachers can also access CCSS-aligned exercises and courses for students from Khan Academy, use CK-12 materials to support students' mastering of science and math concepts, incorporate videos from PBS Learning Media, and share lesson plans with other educators on websites such as Share My Lesson.

Other curated and standards-aligned OER sources popular among teachers are Curriki, Better Lesson, Gooru, EngageNY, and K-12 OER Collaborative (Johnson 2014). OpenEd is one of the world's largest K-12 standards-aligned open educational resources library. During a U.S. Department of Education #GoOpen Exchange event in February 2016, OpenEd publicized the fact that Microsoft had plans to publish a free OpenEd Open Education Search App (OpenEd 2016). In addition, the U.S. Department of Education has included OERs in its 2016 National Education Technology Plan. The U.S. Department of Education's #GoOpen campaign encourages states, school districts, and educators to use openly licensed educational materials to transform teaching and learning.

OERs are free to use and remix for personal use, permitting teachers to easily differentiate instructional material for students (Ash 2012). Schools can form small groups of teachers to design core sets of OER materials for specific grade levels. As a result, individual teachers

can spend less time discovering classroom materials and additional time with their students.

According to *Electronic Education Report* (Schools Interested 2013), schools are more likely to use reliable OERs as supplemental material rather than as a first source for Common Core curricula. Teachers have expressed their concern about a lack of sufficient professional development training within the area of standards-based content. Providing more professional development workshops for teachers would help them recognize how OERs can be used as the main sources in lesson plans (Piehler 2016).

School Librarians and OERs

School librarians provide vital services to their school. These services include selecting print and digital resources, organizing material, and instructing both students and teachers on appropriate technology tools to help augment curriculum units. School librarians have extensive experience in teaching both students and teachers how to identify credible and authoritative online sources and sorting through free and premium information, such as databases, informational text, reference materials, and multimedia. Therefore, school librarians are transformational leaders in supporting OER initiatives in school districts and selecting OERs appropriate for the curriculum (Kompar 2016).

When district officials decree that OERs must be used in their schools, a team of educators usually forms a committee to help identify and select appropriate OERs. School librarians should join these committees and provide expertise in selecting quality OERs, helping to organize them into appropriate curriculum units, and making sure the OERs align with the CCSS. Many educators

may be unfamiliar with copyright and Creative Commons, as well as unaccustomed to using technology to deliver content. School librarians can support their schools' classroom teachers by providing professional development on how to access and share OERs, such as through Google Classroom or Edmodo. Many OERs include interactive features and assessments, such as CK-12's PLIX (Play-Learn-Interact-Explore) interactive exercises. School librarians can help other educators organize and share their OER material in an easily accessible, CCSS-aligned structure—whether for a single lesson, video tutorial, presentation, or full course. All of these efforts can help promote a blended-learning classroom environment as students engage with authentic OERs.

Early Adopters of OERs

Since educators in many school districts are under pressure as they search for CCSS-aligned materials, an increasing number of teachers and policymakers are finding OERs attractive. Such free online, flexible, and sharable instructional content offers advantages that can help schools save money on expensive textbooks. Twenty-six states are promoting open OERs in some form, and eighteen states have taken steps to share them with districts (Cavanagh 2015a).

K-12 school districts in many states have set out on an ambitious new path in using OERs. For example, Bethel (WA) School District exchanged its commercial K-5 math curriculum for OERs created by EngageNY. Part of the New York State Education Department, EngageNY's CCSS-aligned English and math resources have been downloaded twenty million times by various school districts in the United States and overseas (Cavanagh 2015c).

The Grandview (WA) School District changed their entire Pre-K-10 math and English Language Arts curricula by gathering and coordinating OERs from a variety of sources (Cavanagh 2015b).

Freeport (ME) Middle School transformed its eighth-grade math curriculum into a CCSS-aligned program. The program implements an array of OERs, allowing students to investigate math and learn statistical relationships. The program has proven to be effective, and more than 90 percent of the school's eighth-graders passed the annual math placement exam (Waters 2013).

Utah's State Office of Education has been compiling CCSS textbooks constructed entirely of OERs (Welz 2016).

In these and other states, use of OERs has resulted from educational policy changes and resulted in the creation of a set of standards-aligned rubrics to help educators assess OERs' quality (Ash 2012).

OER Policies

In December 2015 use of OERs received a major boost from a federal law signed by President Barack Obama. The OER concept won bipartisan support on Capitol Hill during the drafting of the Every Student Succeeds Act, P.L. 114-95. ESSA now allows states and local education agencies to guide block grant money dedicated to technology toward OERs. In addition, in October 2016 the Obama administration proposed a new regulation that would require that any new intellectual property developed with grant funds from the U.S. Department of Education be made available with an open license. ESSA's Student Support and Academic Enrichment Grants (Title IV-Part A) proclaim OERs as being support for student assistance

Following the lead of the U.S. Department of Education, the policy should require that any OERs created through the expenditure of public funds should have open licenses.

and academic improvement. In 2015 T. J. Bliss, a chief program executive for the William and Flora Hewlett Foundation, identified the recent recognition OERs have received as a notable indicator that OERs are becoming essential to resolving strategic problems in education. Further, Bliss pointed out that the importance of the availability of OERs has finally been acknowledged by policymakers at the national level (Cavanagh 2016).

Nearly every state will develop a local control policy for the adoption and implementation of OER. Guiding teachers and administrators in explaining the advantages, exploring the strategies, and emphasizing quality examples of OERs for school districts should be considered to be part of the control policy. Ideally, in states that have adopted the CCSS, school districts will employ OERs as a strategy for developing content that will support education of college- and career-students (Voss 2015).

Additionally, following the lead of the U.S. Department of Education, the policy should require that any OERs created through the expenditure of public funds should have open licenses. Teaching and learning resources that reside in the public domain or have been released

Common Core Open Educational Resources Websites

Achieve the Core: ELA/Literacy Lessons [and Assessments]	http://achievethecore.org/category/411/ela-literacy-lessons
Achieve the Core: Mathematics Lessons [and Assessments]	http://achievethecore.org/category/854/mathematics-lessons
Annenberg Learner	http://www.learner.org
Better Lesson	http://betterlesson.com/common_core_math
CK-12	http://www.ck12.org/teacher
Curriki	http://www.curriki.org
Digital Public Library of America	https://dp.la
Edcite	https://www.edcite.com
EDSITEment	https://edsitement.neh.gov/
Edutopia: Open Educational Resources (OER): Resource Roundup	https://www.edutopia.org/open-educational-resources-guide
EngageNY	https://www.engageny.org
#GoOpen	http://tech.ed.gov/open/districts
Gooru	http://www.gooru.org/welcome
Great Minds	https://greatminds.org
HippoCampus	http://www.hippocampus.org
iBerry	http://iberry.com
IOER (Illinois Open Educational Resources)	http://ioer.ilsharedlearning.org
Learning Registry	http://learningregistry.org
Khan Academy	https://www.khanacademy.org
Learning Registry	http://learningregistry.org/educators
Lesson Planet	http://www.lessonplanet.com/state-standards
Merlot II	https://www.merlot.org/merlot/materials.htm
OER Commons	https://www.oercommons.org/oer
Open Culture	http://www.openculture.com
OpenEd	https://www.opened.com/search
OpenStax	https://openstax.org
Orange Grove	https://www.floridashines.org/orange-grove
PBS Learning Media	http://www.pbslearningmedia.org/about/products/teachers
PowerMyLearning	http://powermylearning.org/education/learning/educational-games-activities
Share My Lesson	https://sharemylesson.com
Smithsonian Learning Lab	https://learninglab.si.edu
UnboundEd	https://www.unbounded.org
Virtual Library of Conceptual Units	http://smago.coe.uga.edu/VirtualLibrary/index.html

under an intellectual property license that permits their free use and repurposing by others can and should be modified to provide further support for students with special needs. Furthermore, school districts should include OERs in their professional development activities (Voss 2015).

OER Barriers

Because OERs are digital, teachers and students cannot access them without computers, tablets, or smart mobile devices (Waters 2013). Lack of funding and lack of administrative support, along with a lack of commitment to development and use of OERs, are also barriers to the implementation of OER use in school districts (Johnson et al. 2014). An easy-to-use OER platform is needed so teachers can easily search and retrieve content (G. Thompson 2016).

With the onset of the OER movement, the increased popularity of digitally delivered content may present commercial publishers with hardships because of the decreasing demand for conventional hardbound materials. Because school districts desire inexpensive, flexible instructional content, some publishers are adapting and launching their own open resources. For example, Pearson designed an OER platform called Project Blue Sky that permits users to explore post-secondary materials that include textbooks, lesson plans, and videos—both OERs and Pearson-developed (Cavanagh 2013).

Educators understand the benefits of OERs but have realized that using OERs requires sufficient time for searching and assessing materials (G. Thompson 2016). In 2016 the Babson Survey Research Group (2016) published the results

of a survey of over three thousand school faculty members regarding the OER selection process. Faculty awareness of OERs was found to have increased 25 percent over the previous school year. However, the study also reflected educators' concerns about time, effort, and evaluation of the materials—all of which survey participants regarded as substantial barriers (Allen and Seaman 2016).

OER Evaluation

Educators can evaluate whether OERs are aligned with the CCSS by using rubrics and an evaluation tool designed by OER Commons and Achieve, Inc. (Waters 2013). Achieve's EQuIP (Educators Evaluating the Quality of Instructional Products) rubrics determine specific units that are CCSS-aligned. The Student Achievement Partners' Instructional Materials Evaluation Tool (IMET) can be used to assess materials that are currently in use and aid in selecting additional CCSS-aligned material (Piehler 2016). These tools measure OERs based on their technological interactivity and the quality of instructional assignments and practice exercises. School districts, nonetheless, should implement their own final analysis to assure the quality and appropriateness of specific OERs for classroom use (Butcher 2015).

Conclusion

While school districts struggle to locate materials that align to the CCSS, the educational market will become a blend of commercial and open materials. Use of OERs endows educators with many options and, at the same time, addresses their professionalism in selecting the best overall instructional materials. The rise in popularity of OERs demonstrates the growing status of technology in

schools and the demands for personalized instructional content in classrooms (Cavanagh 2013).

Many educators may view use of OERs as a new trend that has emerged in various school districts, especially those OERs that are CCSS-aligned. However, OERs certainly aren't new to education. Many educators have been using these types of materials since the late 1990s (Godwin 2016). Interestingly, there has been increased interest in open education within the last few years because of high—and rising—costs of textbooks and the lack of commercially produced CCSS-aligned material.

School librarians are experienced evaluators and curators of content, and, therefore, valuable assets in school districts adopting OERs. School librarians also have the skills to conduct professional development for colleagues facing the sometimes-daunting task of integrating OERs into their lesson plans.

School librarians can be at the forefront of the increasingly popular Future Ready #GoOpen movement. School librarians can promote OER openness to their schools' classroom teachers and administrators, advocate to selection committees, help fellow-educators review openly licensed works, and focus professional development on currently available OERs. Certainly, librarians' curation of #GoOpen resources can help school districts discover quality OERs. Improving access and the use of learning resources lies at the heart of school librarians' transformational leadership skills. They can and must lead beyond their libraries and be willing to commit to the OER movement.

School districts must recognize the school librarians' expertise

and their skills in supporting cross-curricular active learning, strengthening literacy and critical-thinking skills, and developing higher-order question sets that align to the Common Core State Standards. The use of OERs is transforming education by making free, readily available content obtainable by educators. These types of materials will help school districts create opportunities for educators to collaborate at revolutionary levels and share/remix high-quality resources that are designed by themselves and their colleagues. Recognition of the school librarian's expertise is required for the successful curation of OER content and of CCSS-aligned material in all forms. School librarians are at the center of success for OER curation and Future Ready students, and librarians are leaders in the digital transformation of learning.



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